ber of years from any start point (= 0) at which the 1st of Thoth in the vague year occurred successively further and further from the heliacal rising, until at length, after a period of 1460 years, it coincided again.

As the Sirius-year is longer than the vague one, the first vague year will be completed before the first Sirius-year, hence the second vague year will commence just before the end of the fixed year, and that is the reason that I have reversed the order of months in the diagram (Fig. 4).

Now it is clear that, if the Egyptians really worked in this fashion, any special day in the vague year given as the date of the heliacal rising of Sirius would enable us to determine the number of years which had elapsed from the beginning of the cycle. This will help us to determine whether or not they acted on this principle, or used one widely different. In such an investigation as this, however, we are terribly hampered by the uncertainty of Egyptian dates; while, as I have said before, there is great divergence of opinion among Egyptologists as to whether, from very early times, there was not a true fixed year.

But let us suppose that the vague year was in use, and that the rising of Sirius started the year; then, if we can get any accepted date to work with, and use the diagram to see how many years had elapsed between that date and the start-point of the cycle, we shall see if there be any cyclical relation, and if we find it, it will be evidence, so far as it goes, of the existence of a vague year.

Now it so happens that there are three references, with dates given, to the rising of Sirius in widely different times; and, curiously enough, the month references are nearly the same. I begin with the most recent, as in this case the date can be fixed with the greater certainty. It is an inscription at Philæ, described by Brugsch (p. 87), who states that, when it was written, the 1st of Thoth = 28th of Epiphi. That is, according to the view we are considering, the heliacal rising of Sirius occurred on the 28th of Epiphi in the vague year. He fixes the date of the inscription between 127 and 117 B.C. Let us take it as 122. Next, referring to our diagram to find how many years had elapsed since the beginning of the cycle, we have—

Days.
5 Epacts.
30 Mesori.
2 Epiphi.
—
37 × 4 = 148 years elapsed.

The cycle, then, began in (148 + 122 =) 270 B.C.

We next find a much more ancient inscription recording the rising of Sirius on the 28th of Epiphi. Obviously, if the Sothic cycle had anything to do with the matter, this must have happened 1458 years earlier, *i.e.* about (1458 + 122 =) 1580 B.C. Under which king? Thotmes III., who reigned, according to Lepsius, 1603–1565 B.C.; according to Brugsch, 1625–1577. Now, the inscription in question is stated to have been inscribed by Thotmes III., and, it may be added, on the temple (now destroyed) at Elephantiné.

There is yet another inscription, also known to be of a still earlier period, referring to the rising of Sirius on the 27th of Epiphi. We may neglect the difference of one day; and again, if the use of the Sothic cycle were the origin of the identity of dates, we have this time, according to Oppolzer, a period of 1460 years to add: this gives us (1584 + 1460 =) 3044 B.C. Again under which king? Here we are face to face with one of the difficulties of these inquiries. It may be stated, however, that the inscription is ascribed to Pepi, and that, according to various authorities, he reigned some time between 3000 and 3700 B.C.

We come, then, to this: that one of the oldest dated inscriptions known seems to belong to a system which continued in use at Philæ up to about 100 B.C., and it was essentially a system of a vague year.

Now, assuming that the approximate date of the earliest inscription is 3044 B.C., and that it represented the heliacal rising of Sirius on the 27th of Epiphi; the year 3044 must have been the [(5 + 30 + 3) × 4 =] 152nd after the beginning of the cycle. The cycle, then, must have commenced (3044 + 152 =) 3196 B.C.

According to Biot's calculation, the first heliacal rising of Sirius at the solstice took place in the year 3285 B.C.,

If we assume that the real date of Pepi, who, it is stated, reigned 100 years, included the year 3044 B.C., it may be that the inscriptions to which I have directed attention give us three Sothic cycles beginning—

122 + 148 = 270 B.C.
1580 + 148 = 1728 B.C.
3044 + 148 = 3192 B.C.

J. NORMAN LOCKYER.

(*To be continued.*)

NOTES.

THE list of those on whom honorary degrees are to be conferred at Cambridge on the occasion of the installation of the Duke of Devonshire as Chancellor shows that culture, and especially scientific culture, goes for very little among the classes of distinction recognized by the University. Eminence in the political world and in society seems to be the claim chiefly recognized.

SCIENCE was well represented at the annual dinner of the Incorporated Society of Authors on Tuesday. The chair was occupied by Prof. Michael Foster, and Sir Archibald Geikie was one of those who responded to the toast of "Literature."

DR. A. F. BATALIN has been appointed Director of the Imperial Botanic Garden at St. Petersburg, in succession to the late Dr. E. Regel.

THE ninety-seventh meeting of the Yorkshire Naturalists' Union will be held on Whit Monday, June 6. Some interesting notes on the physical geography and geology, botany, entomology, conchology, and vertebrate zoology of the district have been issued for the benefit of those who intend to be present. We are glad to see that members are expected to "do all in their power to discourage the uprooting of ferns and rare plants, or the too free collection of rarities of any kind."

THE Botanical Society of France has held its annual meeting at Algiers, commencing April 16, under the presidency of the Algerian botanist, M. Battandier. In addition to the reading of papers, excursions were made to Biskra, and other spots on the border of the Sahara.

WE have received the programme of the ninth International Congress of Orientalists. It is to be held in London from September 5 to 12, Prof. Max Müller acting as President. The Duke of Connaught has accepted the office of Honorary President. The following are the Vice-Presidents: the Marquis of Ripon, Lord Northbrook, Lord Reay, Major-Gen. Sir Henry Rawlinson, the Rt. Hon. Sir M. E. Grant Duff, Sir John Lubbock, Sir William Muir, Sir William W. Hunter, Sir George Birdwood, Sir William Markby, Sir Edwin Arnold, the Provost of Oriel College, Oxford, the Master of Balliol College, Oxford, the Master of Christ's College, Cambridge, H. S. King, and M. M. Bhownuggree. The Treasurer is Mr. E. Delmar Morgan. The Honorary Secretaries are: the Rev. C. D. Ginsburg, D.D., Prof. T. W. Rhys Davids, the Rev. E. W. Bullinger, D.D., Prof. A. A. Macdonell, M. M. Bhownuggree, the Raja Peari Mohan Mukharji (for Bengal), Prof. Peterson (for Bombay). Many eminent foreign scholars and members of former Congresses have signified their adhesion, and several important Societies have undertaken to send delegates. The sections into which the work of the Congress has been provisionally divided, are the following (the name of the President being in each case given first, that of the Secretary second):—I. Aryan, Prof. Cowell, Prof. A. A. Macdonell; II. Semitic (*a*) Assyrian and Babylonian, Prof. A. H. Sayce, T. G. Pinches, (*b*) General, Prof. Robertson Smith, A. A. Bevan; III. China and the Far East, Sir Thomas Wade, (for China) Prof. Douglas, (for Japan) Prof. B. H. Chamberlain; IV. Egypt and Africa, Prof. Le Page Renouf, E. Budge; V. Australasia and Oceania, Sir Arthur Gordon, Rev. R. H. Codrington, D.D.; VI. Anthropological and Mythological, Dr. E. B. Tylor; VII. Indian, Lord Reay, Prof. T. W. Rhys Davids; VIII. Geographical, Sir M. E. Grant Duff, Halford J. Mackinder; IX. Archaic Greece and the East, the Rt. Hon. W. E. Gladstone.

The Committee of the two International Congresses of Prehistoric Archæology and Zoology, which will be held at Moscow this summer in connection with the Geographical and Anthropological Exhibition, has announced, in accordance with a decision of the Russian Railway Department, that all members of the Congresses and exhibitors at the Exhibition may obtain tickets with a 50 per cent. reduction for travelling to Moscow and back. Exhibits may be sent and will be returned on the same terms. As there are at Moscou two different Societies, the Société des Naturalistes de Moscou and the Society of Friends of Natural Science (*Obschestvo Lubitelei Estestvoznaniya*), it may be worth while to note that it is the latter which is organizing the Exhibition and the two Congresses, and to which all applications for the Exhibition must be made.

It is stated that the Secretary of State for the Colonies has appointed Miss Doberck, formerly Government Meteorological Observer in Sligo, to be Assistant Meteorologist in Hong Kong. Miss Doberck's father has for some years past been the head of the Meteorological Observatory in Hong Kong.

Lieutenant-Colonel Holdich, of the Survey of India, will, it is said, personally superintend the mapping out of Captain Bower's journey across Tibet. The work will be done in the Survey drawing offices at Simla, where Captain Bower is at present engaged in preparing the report of his journey.

It is bad news for farmers that the diamond-back moth has made its appearance in Yorkshire and Northumberland. Specimens from both counties have been identified by Miss Ormerod.

The weather during the past week has been noteworthy for the occurrence of thunderstorms, copious rainfall at nearly all places, and excessive temperatures at most of the English stations. In London a severe thunderstorm was experienced on Thursday morning, May 26 (succeeding one that occurred the previous evening), with a heavy downpour of rain varying from 0·7 inch to 1·0 inch in different parts of the metropolis. At 8h. a.m. on Saturday the thermometer registered 76° in London, being the highest recorded at that hour this year. The type of wind has been cyclonic, with light or moderate south-westerly breezes generally. The Meteorological Office report for the week ending May 28, shows that the rainfall was equal to the normal value in the south and east of England, and exceeded it in all other districts; while in the northern parts, in Ireland and in Scotland, the fall was about three times as much as the mean. On Sunday the temperature was considerably lower, but since then it has again become abnormally high, the maxima in the shade registering 75° and upwards in places over the southern parts of the kingdom, 83° being registered in London on Tuesday; and thunder-showers occurred in various places on that day.

The detailed despatches brought to Marseilles from Port Louis by the mail steamer *Australien* confirm all that was stated in the telegrams relating to the hurricane which devastated Mauritius on April 29. A Reuter's telegram from Marseilles, giving a summary of the despatches, says that the total number of lives lost amounted to 1200, while the list of persons injured exceeded 4000. Strong magnetic disturbances were noticed on April 25, and continued with increasing intensity on the three following days. Several well-defined groups of sun-spots were also noticed at the same time. On the afternoon of the 28th, the eve of the hurricane, there was a vivid display of lightning and a good deal of thunder, while the air grew peculiarly heavy. On the following morning the tempest broke over the island in all its fury, the velocity of the wind at times reaching 112 miles an hour. The sea rose 9 feet above its usual level, a thing unknown since the terrible cyclone of 1818, when the water rose nearly four metres. In Port Louis itself houses fell to the ground in nearly every street. In the Tringlar quarter not a single house was left standing. In fact, there is scarcely a house in the entire colony which does not show some signs of the fury of the storm. Half the sugar crop has been destroyed. An immense number of persons were overwhelmed and killed by the ruins of the falling houses, or were stricken down in the streets, as they fled, by the falling stones and wreckage.

A very destructive cyclone passed over various towns in Kansas, on May 27. The storm gave no signs of its approach. Travelling in a north-easterly direction, it struck Wellington (a town containing a population of 10,000) at nine o'clock in the evening, when most people were indoors. Within a few seconds the central parts of the town coming within its track were devastated from end to end. Wellington Avenue, the principal business street, is lined on both sides with ruins, whole blocks of buildings having been shaken and overthrown as violently as if the place had been rocked by an earthquake. Numbers of victims were buried in the ruins, and of those who momentarily survived many were found struggling for their lives in order to escape from the flames which broke out in all directions in consequence of the sudden escape of gas. The towns of Harper and Argona were also visited by the cyclone. In the former town seven people were killed in the wreck of the buildings, and five at the latter. It is estimated that between twenty and thirty people lost their lives in the cyclone; while seventy others have been more or less injured.

On Tuesday, May 3, a fall of hail mixed with foreign particles was observed in Stockholm, and appears to have extended as far as Christiania. The fall of dust lasted from 1 to 8 p.m., and was abundant enough to allow of considerable quantities being collected. At a meeting of the Geologiska Förening in Stockholm, remarks were made by Baron Nordenskiöld, and Messrs. N. Holst, E. Svedmark, and Törnebohm, from which it appears that the dust contained glassy, isotropic, and various anisotropic particles, hornblende, magnetite, minute scales of mica, metallic iron, and some diatoms.

The Tiflis *Kavkaz* gives the following description of a meteor of great brilliancy which was observed at Tiflis, on May 10. It appeared at 11 p.m. in the west part of the sky, was of a round shape, and very brilliant. Three seconds after its appearance a part of it separated, moving towards the Mtatsminda Mountain, and disappeared below the horizon, after lighting the slopes of the mountain, the central meteor continuing to move, but having lost for a few seconds its great brilliancy, which, however, soon reappeared. In about 30 seconds after the first appearance of the meteor, a second small part separated from it, increasing in size as it approached the earth. This also disappeared in the west, behind the same mountain, after having brilliantly lighted for two or three seconds its slopes and gorges. After that, the meteor took first a milky coloration, but soon became bright again, and of phosphoric aspect. A third part separated from it, but it was much smaller and not so brilliant as the two former. Finally the meteor disappeared behind the clouds—a white, lighted blot being seen through them—and gradually faded away. The phenomenon lasted altogether about three minutes.

WE learn from the *Pioneer Mail* that a smart shock of earthquake was felt at Madras on May 6, about ten minutes to ten o'clock. The sound heard was at first like distant thunder, and afterwards like a railway train, running close by. The shock was distinctly felt. The weather was cloudy and the atmosphere still at the time.

THE *Annuaire Géologique universel*, founded by Dr. Dagincourt in 1885, and continued under the editorship of Dr. L. Carez for geology, and of M. H. Douvillé for palæontology, has now reached its seventh volume. Each year the work has increased in value, and it now affords an admirable *résumé* of geological literature. Hitherto each volume has been issued in a complete form, but the latest has appeared in four parts. By the arrangement adopted there is some repetition, but this enables information required to be readily obtained. There is first a fairly complete list of papers and other publications, then a systematic account of the various main chronological divisions of formations; this is followed by a description of separate districts; and finally we have a summary of palæontological work. The stratigraphical notes are not always complete in each volume, sometimes two years are grouped in one yearly issue; for instance, this volume contains no account of the Triassic and Tertiary rocks, whilst the Cretaceous works of 1890-91 are here included. The volume contains lists of geologists in France, Belgium, and the British Isles; next year we are promised lists for other European countries. The editors are assisted by a large staff of workers in various countries.

M. E. RIGAUX, of Boulogne-sur-Mer, who has devoted many years to the study of the geology of the Bas Boulonnais, has published an excellent account of this region in the *Mémoires de la Soc. Académ. de Boulogne* (vol. xiv., 108 pp.). The district is of especial interest to English geologists because of the fine development there of the Devonian and Carboniferous rocks, and of the Jurassic series from the Great Oolite upwards. The coal, formerly supposed to lie within the Carboniferous Limestone series, is now known to be true coal measures, over which the older rocks have been thrust. The paper gives an account of several important deep borings, in some of which Silurian rocks have been reached beneath the Jurassic series. Thirteen new species of fossils are described.

DURING the past season, Dr. Sheldon Jackson, the Government Agent of Education in Alaska, introduced into Alaska from Siberia sixteen reindeer. Next year he proposes to establish a herd of reindeer in the neighbourhood of Fort Clarence, and he expects to begin with 100 animals. The *Scientific American*, which records these facts, is of opinion that from an economical point of view the experiment is of the highest interest, because the reindeer is useful as a draught animal for sledges, as well as for its milk, its meat, and its skin. As it flourishes in Siberia, there seems to be no reason why it should not also flourish in Alaska, where the conditions of climate and vegetation are very similar to those of Siberia.

THE editors of the *Entomological Monthly Magazine* note that at the sale of the late Mr. Arthur Naish, of Bristol, at Stevens's Rooms on May 16, some of the extinct (or nearly extinct) species of British Lepidoptera fetched high prices. Seven examples of *Lycæna dispar* (the long extinct British form of *L. Hippothoë*) realized £16 8*s*., or an average of nearly £2 7*s*. each. A lot containing four *Polyommatus Acis* (perhaps extinct) was sold for 18*s*. Eight *Lælia cænosa* (apparently recently extinct) were sold for £3 17*s*. 6*d*. Two *Cleora viduaria* (not found very recently) were knocked down for a guinea. Seven *Noctua subrosea* (long extinct as British, and the continental form of which, *subcærulea*, is very different in appearance) obtained £6 12*s*., one very fine example realizing £2 10*s*.

MR. C. W. DALE, writing from Glanvilles Wootton, records, in the June number of the *Entomologist's Monthly Magazine*, that the effect of the weather upon insect life in Dorsetshire during April was remarkable. Butterflies were unusually plentiful, moths unusually scarce. The conclusion he draws is that easterly winds, with frosts at night, are injurious to moth life, but do not affect butterfly life, so long as there is plenty of blue sky and sunshine. These were the general meteorological conditions in Dorsetshire during April.

MESSRS. LONGMANS, GREEN, AND CO. have issued a new and revised edition (the third) of Mr. W. A. Shenstone's "Practical Introduction to Chemistry." It contains the practical introductory course of work in use at Clifton College. In this edition the author has made several changes which have been suggested by his own experience and that of various friends.

THE forty-fourth part of Cassell's "New Popular Educator" has been published. It includes two coloured maps, one of Asia Minor, the other of Palestine.

CYANIDE of arsenic, $As(CN)_3$, has been prepared by M. Guenez, and is described by him in the current number of the *Comptes Rendus*. It has been obtained by the action of finely divided elementary arsenic upon iodide of cyanogen, CNI, a substance which is usually obtained crystallized in delicate, transparent needles, frequently attaining the length of several inches. About thirty grams of perfectly dry cyanogen iodide were placed in a strong Wurtz flask, together with seven grams of powdered arsenic and sixty to seventy cubic centimetres of carbon bisulphide previously dried over phosphoric anhydride. The air contained in the flask was then displaced by dry carbon dioxide and the flask sealed. The reaction was found to commence in the cold, crystals of tri-iodide of arsenic soon making their appearance. But, in order to complete the conversion of the iodide of cyanogen into arsenic cyanide, it was found necessary to heat the flask for about twenty-four hours over a water-bath. The heating is best carried out in successive periods of seven or eight hours, allowing the flask to cool after each period and subjecting the contents to brisk agitation. Under these circumstances a quantitative yield of arsenic cyanide was obtained, in accordance with the following equation:—

$$2As + 3CNI = AsI_3 + As(CN)_3.$$

In order to isolate the cyanide, advantage was taken of its insolubility in carbon bisulphide, arsenic iodide being readily soluble. The product of the reaction was therefore placed in a continuous extracting apparatus, in which it was thoroughly exhausted with pure carbon bisulphide. The residual cyanide was subsequently dried in a current of carbon dioxide, and preserved in sealed tubes previously filled with the same indifferent gas.

CYANIDE of arsenic obtained in the manner above indicated is a slightly yellow substance consisting of small crystals, which under the microscope are observed to be well formed, and to possess a deep yellow colour by transmitted light. The crystals are extremely deliquescent, being instantly decomposed by water with production of arsenious oxide and prussic acid:

$$2As(CN)_3 + 3H_2O = As_2O_3 + 6HCN.$$

When heated, arsenic cyanide evolves about a third of its cyanogen in the form of gaseous di-cyanogen, the residue consisting of a mixture of free arsenic and paracyanogen. When brought in contact with concentrated sulphuric acid and slightly warmed, mutual decomposition occurs, with liberation of sulphur dioxide and carbon monoxide, the nitrogen remaining in the form of ammonium sulphate. Iodine reacts with arsenic cyanide in an energetic manner, even in the cold, forming iodides of arsenic and cyanogen without the volatilization of any iodine. With potassium chlorate, arsenic cyanide forms a mixture which detonates with considerable violence when struck.

THE additions to the Zoological Society's Gardens during the past week include two Black-backed Jackals (*Canis mesomelas*) from South Africa, presented by Master Logan; two North African Jackals (*Canis anthus*), four —— Gerbilles (*Gerbillus* sp. inc.), an Egyptian Jerboa (*Dipus ægyptius*), six Leith's Tortoises (*Testudo leithii*), five Common Skinks (*Scincus officinalis*), an Egyptian Eryx (*Eryx jaculus*), a Schneider's Skink (*Eumeces schneideri*), two Crowned Snakes (*Zamenis diadema*), a Hissing Sand-Snake (*Psammophis sibilans*) from Egypt, presented by Dr. J. Anderson, F.R.S., F.Z.S.; a Cinerous Vulture (*Vultur monachus*) from Aden, presented by Mr. W. H. Still; a Common Peafowl (*Pavo cristatus* ♂) from India, presented by Colonel Bagot-Chester; two African Love-Birds (*Agapornis pullaria*) from West Africa, presented by Lady McKenna; a Chinese Goose (*Anser cygnoides* ♂) from China, presented by Miss Hill; two Common Vipers (*Vipera berus*), four Common Snakes (*Tropidonotus natrix*), a Slowworm (*Anguis fragilis*), British, presented by Mr. C. Browne; a Mocassin Snake (*Tropidonotus fasciatus*) from North America, presented by Master Denny Stradling; two Purple-capped Lories (*Lorius domicella*) from Moluccas, two Scaly-breasted Lorikeets (*Trichoglossus chlorolepidotus*) from Timor, deposited; four Common Sheldrakes (*Tadorna vulpanser*, 2 ♂, 2 ♀), four Ringed Doves (*Columba palumbarius*, 2 ♂, 2 ♀), European, purchased; two Black-eared Marmosets (*Hapale penicillata*), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

WINNECKE'S PERIODIC COMET, 1892.—The following ephemeris for this comet has been extracted from *Astronomische Nachrichten*, No. 3083. The comet itself is becoming decidedly brighter, and will be found just between the Great Bear and Leo Minor.

Berlin Midnight.

1892.	App. R.A.			App. Decl.			log Δ.	log *r*.	Br.
	h.	m.	s.	°	′	″			
June 2	10	50	23·4	+43	11	46·0	9·9949	9·5376	8·61
3		48	52·4		4	31·4			
4		47	16·4	42	56	59·7			
5		45	34·6		49	10·6			
6		43	46·4		41	2·7	9·9837	9·5012	10·72
7		41	50·7		32	34·0			
8		39	47·0		23	42·0			
9		37	34·4		14	23·5			

SATURN'S RINGS.—At the present time the earth may be said to be very nearly in the plane of Saturn's Rings, thus affording observers an opportunity of examining the ring from the sectional point of view. M. Bigourdan communicates to the *Comptes rendus* (No. 21) the results of a study he has just made, with reference to some peculiarities he has found to exist. The preceding arm of the ring, he says, presented nothing very abnormal, but it appeared to thin rather than thicken whilst approaching the planet. The amount of thinning in the case of the following arm was much more striking. At a distance of two-thirds of the length of the arm it commenced to leave the outside edge, continuing gradually, and producing "the appearance of a luminous angle, regular and very pointed, the apex of which joined to the disk of the planet." Observed again on May 21, the following arm showed a protuberance situated near Cassini's division. In M. Bigourdan's own words, the above appearances could be produced by an "elevation of the level edging the separation of Cassini, and producing on the opposite face a luminous pad which would nearly double the apparent thickness of the ring."

GEOGRAPHICAL NOTES.

Petermann's Mitteilungen for June contains the long-expected account of Emin Pasha's return expedition to the equatorial lakes, written by his companion, Dr. Stuhlmann. Leaving Kahura in March 1891, they traversed an unknown region to the southern shore of Lake Albert Edward, which they followed round its western side, and marched as far north as the Ituri in 2° 13′ N. Here the party had to turn. Emin met a number of his old followers living near Kavalli, on Lake Albert, and many of them joined his expedition. The return journey was disastrous. An outbreak of small-pox made it necessary to divide the expedition; Emin was left behind, while Stuhlmann went on with those able to travel and reached the German station of Bukoba on Lake Victoria in February 1892. The scientific observations made necessitate certain corrections on the map of this part of Africa. Mount Mfumbiro is further west than originally supposed, and may even lie within the boundaries of the Congo State. It is a volcanic chain, one of the peaks of which, Mount Virungo, is apparently still active. Stuhlmann gives the level of Lake Albert Edward as 2750 feet instead of 3307 as determined by Stanley.

SIR WILLIAM MACGREGOR continues to give proofs of remarkable energy as an explorer, and of tact and skill as Administrator of British New Guinea. In the early part of this year he has been engaged in a series of journeys through the south-eastern districts of the possession, and everywhere he has found the natives peaceful and friendly. In a recent coasting trip he passed several islands, which at first sight appeared uninhabited, but on landing he discovered that this appearance was due to their singular configuration. A narrow belt of gently sloping land led from the sea to a steep wall of coral rock, from 300 to 400 feet high, from the summit of which an undulating plateau was seen dipping inland. Here the villages were built, from 50 to 100 feet below the level of the encircling rim, and sheltered from the trade-winds. Sir William considers these islands to be upraised atolls, modified in most cases by subsequent wave action on the shore strips.

LIEUTENANT T. H. BARNES, on behalf of the Bolivian Government and the Argentine Geographical Society, is investigating the navigability of the Rio Otuquis, a tributary of the Upper Paraguay, in the hope of opening a new route for Bolivian trade.

LIEUTENANT MIZON, compelled by the passive resistance of the Royal Niger Company to relinquish his projected journey by the Benué to Lake Chad, has (according to *La Politique Coloniale*) crossed the watershed to the Congo Basin, and on his way from the Benué to the Sangha, traversed the hinterland of the German Cameroon colony, one of the rapidly-shrinking blank spots on the map of Africa. Reports from Tripoli state that Captain Monteil is pushing on from Kano, in Sokoto, to Bornu and Lake Chad.

THE collection of educational appliances, books, atlases, &c., made by Mr. J. Scott Keltie on behalf of the Royal Geographical Society in 1885, has been lent to the Teachers' Guild of Great Britain and Ireland, in whose rooms at 74 Gower Street it has been admirably arranged by Miss Busk. This collection, which after its original appearance in London was shown in most of the large towns in the country, has never been more effectively displayed. When first brought together, the inferiority of the British school atlases and text-books to the German and French productions was very marked; but during the last seven years English publishers have made great advances, and several of the newer and better publications have been added. It would be most desirable if the department of English books, maps, and geographical appliances could be made thoroughly representative, so that teachers would have a real opportunity of comparing the best work of 1892 with that which was current in 1885.

MR. H. J. MACKINDER, Reader in Geography at Oxford, has recently returned from a brief visit to the United States, where he has been devoting special attention to the state of the